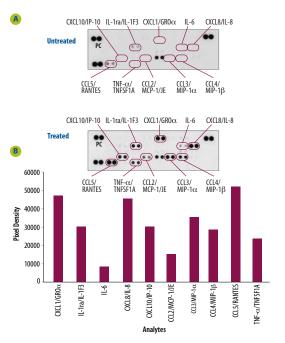
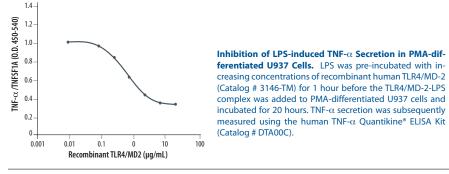


#### Assessing the Cytokine Response to the TLR Agonist LPS



Human Cytokine Array Analytes			
• C5a	• IL-13		
• CD40 Ligand	• IL-16/LCF		
• G-CSF	• IL-17		
• GM-CSF	• IL-17E		
• CXCL1/GRO $\alpha$	• IL-23		
• CCL1/I-309	• IL-27		
• ICAM-1/CD54	• IL-32a		
• IFN-γ	• CXCL10/IP-10		
• IL-1α/IL-1F1	• I-TAC		
• IL-1β/IL-1F2	• CCL2/MCP-1/JE		
• IL-1ra/IL-1F3	• MIF		
• IL-2	• CCL3/MIP-1α		
• IL-4	• CCL4/MIP-1β		
• IL-5	Serpin E1		
• IL-6	CCL5/RANTES		
• CXCL8/IL-8	• CXCL12/SDF-1		
• IL-10	•TNF-α/TNFSF1A		
• IL-12 p70	• TREM-1		

**Detection of Multiple Analytes by Cytokine Array Analysis. A.** THP-1 cells were untreated or treated with LPS (1 µg/mL) for 16 hours. The conditioned media was assessed for the relative levels of 36 different cytokines using the Proteome Profiler™ Human Cytokine Array Kit (Catalog #ARY005). PC = Positive Control B. Histogram profiles for select analytes following LPS treatment were generated by quantifying the mean spot pixel densities from the cytokine array using image analysis software.





#### **R&D Systems, Inc.**

614 Mc	Kinley Place NE				
Minneapolis, MN 55413					
TEL:	(800) 343-7475				
	(612) 379-2956				
FAX:	(612) 656-4400				
www.PnDSystoms.com					



Printed on recyclable paper 10% post consumer waste.

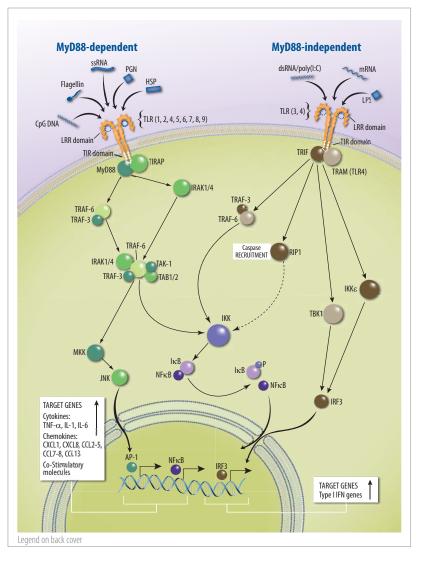
### FRONT COVER ILLUSTRATION

Toll-like receptor signaling pathways. Toll-like receptors (TLRs) are Type I transmembrane proteins located either on the cell surface or in intracellular compartments such as endosomes or lysosomes. These receptors contain multiple copies of a leucine-rich repeat (LRR) motif in the extracellular domain and a Toll/IL-1 receptor (TIR) domain in the cytoplasmic portion. TLRs can homo-, and heterodimerize. TLRs respond to a variety of different ligands both exogenous and endogenous, including peptidoglycan (PGN), heat shock proteins (HSP), flagellin, CpG DNA, ssRNA, lipopolysaccharide (LPS), mRNA, dsRNA/poly (I:C), and other microbial proteins and lipids not shown. Ligand binding to TLRs stimulates their interaction with the adaptor proteins, MyD88, TIR domain-containing adaptor inducing IFN- $\beta$  (TRIF), TRIF-related adaptor molecule (TRAM), or TIR domain-containing adaptor protein (TIRAP). In the MyD88-dependent signaling pathway (left), MyD88 recruits members of the IL-1R-associated kinase family (IRAK1/4) and the TNF receptor-associated factors (TRAF-3/6) by the TIRAP adaptor protein. IRAK1/4 and TRAF-3/6 associate with TGF-β-activated kinase (TAK-1) and its binding partners, TAB1 and TAB2 leading to activation of the IkB kinase kinases (IKK) and MAPK kinases (MKK). MKKs activate c-Jun N-terminal kinases (JNK), which then translocate to the nucleus and induce AP-1 activity. Activated IKKs phosphorylate IkB disrupting its interaction with NFkB and allowing NFkB to translocate to the nucleus. AP-1 and NFκB activate the transcription of pro-inflammatory cytokines, chemokines, and co-stimulatory molecules. The MyD88-independent TLR signaling pathway (right) involves the recruitment of TRIF or TRAM which recruit TRAF-3/6 or receptor interacting protein kinase 1 (RIP1) to induce the activation of NFκB. TRIF can also activate TANK-binding kinase 1 (TBK1) and the IKKE kinase. Activated TBK1 and IKKE can both phosphorylate interferon regulatory factor 3 (IRF3) leading to the induction of Type I IFN genes.

> PRSRT STD U.S. POSTAGE **PAID** R&D SYSTEMS

## **R&D Systems** Tools for Cell Biology Research<sup>™</sup>

# **Toll-like Receptors:** Recognition of Microbial Pathogens & Induction of the Immune Response





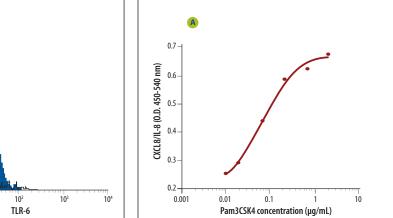


# **Toll-like Receptor Signaling Pathways**

Toll-like receptors (TLRs) are a class of pattern recognition receptors (PRRs) in mammals that are related to the IL-1 receptor (IL-1R) superfamily. TLRs are involved in initiating the innate and adaptive immune responses following infection by microbial pathogens. They are activated upon recognition of conserved pathogen-associated molecular patterns (PAMPs) that are present in microbial proteins, nucleic acids, lipids, and carbohydrates. These PAMP-containing molecules act as ligands to trigger TLR-dependent signal transduction cascades that ultimately activate the transcription factors, AP-1, NFκB, and IRF3. AP-1 and NFkB induce the expression of pro-inflammatory cytokines (IL-1, IL-6, TNF- $\alpha$ ), chemokines (CXCL8/IL-8, CXCL1/GROα, CCL2/ MCP-1/JE, CCL3/MIP-1 $\alpha$ , CCL4/MIP-1 $\beta$ ,

CCL5/RANTES, CCL7/MCP-3, CCL8/MCP-2, CCL13/MCP-4), and co-stimulatory molecules. IRF3 stimulates the expression of Type I IFN-inducible genes. TLR-dependent expression of pro-inflammatory molecules at an infection site results in the recruitment of leukocytes that increase the killing of pathogenic microbes and infected cells. TLRs have a leucine-rich extracellular domain, a single transmembrane domain, and a cytoplasmic domain containing a Toll/IL-1R (TIR) motif. This domain mediates intracellular interactions between TLRs and other TIR-domain containing molecules, including adaptor proteins such as MyD88, TIRAP, TRIF, and TRAM. Humans express ten different TLRs, each recognizing a distinct set of exogenous and endogenous ligands.

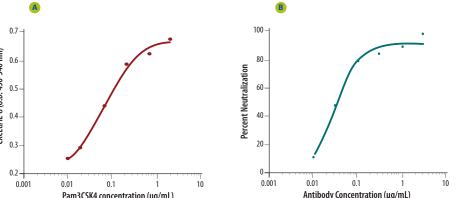
Some TLRs are located on the cell surface (TLR1, 2, 4, 5, 6, 10) and specialize in the recognition of bacterial products, while others are located in intracellular compartments (TLR3, 7, 8, 9) and recognize viral nucleic acids. Different types of immune system cells each express a distinct subset of TLRs allowing vigilant surveillance for bacterial, viral, and fungal infections. Polymorphisms in the TLRs or in TLR-signaling molecules have been linked to immunodeficiencies in response to bacterial and viral infections, and to human disease conditions such as asthma, atherosclerosis, cancer, late onset Alzheimer's disease, and rheumatoid arthritis. R&D Systems offers a wide range of research reagents useful for the study of TLR signaling pathways.



Detection of TLR6 by Flow Cytometry. Raw264 cells were stained with an anti-mouse TLR6 monoclonal antibody (Catalog # MAB1533; filled histogram) or rat IgG<sub>2</sub>, isotype control antibody (Catalog # MAB006; open histogram) followed by PE-conjugated anti-rat secondary antibody (Catalog # F0105B).

101

100



Pam3CSK4-induced CXCL8/IL-8 Secretion & Neutralization. A. CXCL8/IL-8 secretion in response to increasing doses of Pam3CSK4 (a synthetic bacterial lipopeptide) was determined in HEK293 cells transfected with TLR2 using the human CXCL8/IL-8 Quantikine® ELISA Kit (Catalog # D8000C). B. The ability of Pam3CSK4 to stimulate CXCL8/IL-8 production in HEK293 cells transfected with TLR2 was neutralized by increasing concentrations of the anti-human TLR2 monoclonal antibody (Catalog # MAB2616).

#### **TLR-Related Products**

TOLL-LIKE RECEPTORS				
Molecule	Antibodies	Proteins	ELISAs/Assays	Primer Pairs
TLR1	НМ	Μ		HMR
TLR2	НМ	НМ		HMR
TLR3	НМ	НМ		HMR
TLR4	НМ	Н		HMR
TLR5				HMR
TLR6	М	М		HMR
TLR9	Н			H M R

Molecule	Antibodies	Proteins	ELISAs/Assays	Primer Pairs
c-Jun	H M	FIOLEIIIS	LLIJAS/ASSays	
JNK	HMR		H M R	
JNK1	HMR	Н	HMR	
JNK2	H M R		HMR	
<b>ΙκΒ-</b> α	Н			
<b>ΙκΒ-</b> β	H R			
<b>ΙkΒ-</b> ε	НM			
ΙΚΚα	H M R			
ΙΚΚβ	Н			
ΙΚΚε	HMR			
ΙΚΚγ	H M R			
IRAK1	Н			
IRAK4	Н			
IRF3	НМ			
MKK4	Н			
МКК7	Н			
MyD88	HMR			
NFĸB1	НМ			
<b>ΝF</b> κ <b>B2</b>	Н			
Phospho-JNK	HMR		HMR	
RIP1	HMR			
TAB1	НМ			
TRAM/TICAM2	HMR			
TRAF-3	HMR			
TRAF-6	Н			

PROTEOME PROFILER™ CYTOKINE ARRAY KITS			
Kit	Catalog #		
Human Cytokine Array Kit	ARY005		
Mouse Cytokine Array Kit	ARY006		
Rat Cytokine Array Kit	ARY008		



MoleculeAntibodiesProteinsELISA/AssaysPrimer PairsCCL2/MCP-1/JEHM Ga CRHM RCaHM CaHCCL3/MIP-1αHM CRHM CRHMHCCL3/MIP-1βHM CRHM CRHMICCL4/MIP-1βHM CRHM CRHMICCL5/RANTESHM CRHM CRHICCL5/MCP-3HM CRHHICCL3/MCP-4HMHHICCL13/MCP-4HAHCa FPHCa PAHCaCCL13/MCP-4HCa FPHCa FPHCa PAHCaCCL13/MCP-4HCA FPHCA FPHCAICCL13/MCP-4HCA FPHCA FPHCAICCL13/MCP-4HCA FPHCA FPHCAICCL13/MCP-4HM CRHM CRHICCL13/MCP-4HCA FPHCA FPHCAICCL13/MCP-4HM CRHM CRIICCL13/MCP-4HM CRHM CRIICCL13/MCP-4HM CRHM CRIICCL13/MCP-4HM CRHM CRIICCL13/MCP-10HM CRHM CRIIIFAHM CRHM CRHM CRIIIFAHM CRHM CRHM CRIIIL-14/LIFIHM CRHM CRHM CRIIIL-15/FILI%HM EPHM RCACREHM RCACREIIIL-16/FILI%HM EPHM REAIII<	TLR-SIGNALING TARGETS				
CCL3/MIP-1αHM CRHM CRHMCCL4/MIP-1βHM CRHM CRHMCCL5/RANTESHM CRHM CRHMCCL5/RANTESHM CRHMHCCL7/MCP-3HMHMHCCL3/MCP-4HH-CCL13/MCP-4HH-CXCL1/GR0αHHCa FPHCa PKXCL1/GR0αHH-CXCL10/IP-10HM CRHM CRHMFN-αHM CRHM CRHMIFN-βHM RCRPHMRCR PPHMIL-16//IL-1F1HM RCRPHMR CRPHMRIL-16//IL-1F2HM RCaCRFPHM RCaCREFHMRFPIL-1F5/FILIδHHM-IL-1F5/FILIδHMHM-IL-1F9/IL-1H1HH-IL-1F9/IL-1H2HMRCaCREFHMRCaCREFHMRCaFPIL-16/IL-1F3HMEPHMRCA-IL-16/IL-1F4HMIL-179/IL-1F3HMEPHMIL-179/IL-1F3HMEPHMIL-16HMRCaCREFHMRCaFPIL-16HMRCaCREFHMRCaFPIL-16HMRCaCREFHMRCaFPIL-12HMRCaFPHMRCaFPHMRCaFPHMRCaFPHMRHMRCaFPHMRCaFPHMRIL-12HMRCAFEHMRCAFPHMRCAFFHMRCAFFHMRCAFFPIL-12HMRCAFFHMRCAFFHMRCAFFHMRCAFFHMRCAFFHMRCAFFHMRCAFFHMR </th <th>Molecule</th> <th>Antibodies</th> <th>Proteins</th> <th>ELISAs/Assays</th> <th>Primer Pairs</th>	Molecule	Antibodies	Proteins	ELISAs/Assays	Primer Pairs
CCL4/MIP-1βH M CRH M CRH M CRH MCCL5/RANTESH M CRH M CRH MCCL5/RANTESH M CRH MHCCL7/MCP-3H MH MHCCL8/MCP-2H MH HHCCL13/MCP-4H MH CAHCXCL1/GR0αH Ca FPH Ca PH Ca PTXCL10/IP-10H M CRH M CRH MFN-αH M CRH M CRH MIFN-βH M RCPH M RCPH MIL-1α/IL-1F1H M RCPH M RCPH M RIL-15/FILIδH M RCa CRFPH M RFPIL-16/FIL1εH MH MIL-1F5/FILIδH MH MIL-1F9/IL-1H1H MH MIL-1F9/IL-1H1H MHIL-1F1/IL-1F3H M RCa CREFH M RCa CREIL-16/FIL1εH M RCa CREH MIL-1F9/IL-1H1H MH MHIL-1F9/IL-1H1H MIL-1F0/IL-1H2H M RCa CREIL-16H M RCa CREIL-17H M RCa CREIL-16H M RCa CREIL-17H M RCa CREIL-16H M RCa CREIL-17H M RCa CREIL-16H M RCa FPP <tr< th=""><th>CCL2/MCP-1/JE</th><th>H M Ca CR</th><th>H M R Ca</th><th>H M Ca</th><th></th></tr<>	CCL2/MCP-1/JE	H M Ca CR	H M R Ca	H M Ca	
CCL5/RANTES     HM CR     HM CRF     HM       CCL7/MCP-3     HM     HM     H       CCL3/MCP-4     HM     H     H       CCL13/MCP-4     H     H     H       CCL13/MCP-4     H     H     H       CCCL13/MCP-4     H     H     I       CCCL13/MCP     HMCR     HMR     HM       CCCL13/MCP     HMCR     HMR     H       IFn-A     HMCR     HMRCR     HM       IL-16//IL-1F1     HMRCACRE     HMR     H       IL-15//FILI%     H     H     H     H </th <th>CCL3/MIP-1α</th> <th>H M CR</th> <th>H M CR</th> <th>НМ</th> <th></th>	CCL3/MIP-1α	H M CR	H M CR	НМ	
CCL7/MCP-3HMHMHCCL8/MCP-2HMHHCCL13/MCP-4HHHCCL13/MCP-4HHHCXCL1/GR0αHHHCXCL1/JROQHQHCa FPHCa PHCXCL10/IP-10HMCRHMCRHMHIFN-αHMCRHMRCRPHMHIFN-βHMRHMRHMIIL-1α/IL-1F1HMRCRPHMRCRPHMRIL-1β/IL-1F2HMRCa CRFPHMRCRPHMRFPIL-1F5/FILIδHHIIL-1F5/FILIδHMHMIIL-1F3/FILIδHMRHMIIL-1F3/FILIδHMHMIL-1F3/FILIδHMRHMIL-1F3/FILIδHMRHMIL-1F3/FILIδHMRHMRIL-1F3/IL-1H1HHIL-1F3/IL-1F3HMRPHMRCaIL-1F3/IL-1F4HMRCa CREFHMRCa CREFIL-1F3/IL-1F3HMRCA CREFHMRCa CREFIL-16HMRCa CREFHMRCa CREFIL-10HMRCa CREFHMRCa CREFIL-12HMRCa FPHMRCa FPIL-12HMRCa CREHMRCa CREHMRCa CREHMRCa CREHMRCa EFP	CCL4/MIP-1β	H M CR	H M CR	НМ	
CCL8/MCP-2HMHHCCL13/MCP-4HHHCCCL13/MCP-4HHHCXCL1/GROαHHHCXCL1/GROαHHCa FPHCa PHCXCL10/IP-10HMCRHMCRHMHIFN-αHMCRHMRCR PPHMIIFN-βHMRHMRCRPHMRIIL-1α/IL-1F1HMRCa CRFPHMRHMRIL-1β/IL-1F2HMRCa CRFPHMRCa CREFHMRFPIL-1F5/FILIδHHMIIL-1F5/FILIδHMHMIL-1F5/FILIδHMHIL-1F3/FILIβHMHMIL-1F3/FILIβHMHIL-1F3/FILIβHMRHMIL-1F3/FILIβHMRHMIL-1F3/FILIβHMRHMRIL-1F3/FILIβHMRHMRIL-1F3/FILIβHMRPHMRIL-1F3/FILIβHMRPHMRIL-1F3/FILIβHMRPHMRIL-1F3/FILIβHMRPHMRIL-1F3/FILIβHMRPHMRCAIL-1F3/FILIβHMRPHMRCAIL-1F3/FILIβHMRPHMRCAIL-1F3/FILIβHMRPHMRCAIL-1F3/FILIβHMRPHMRCAIL-1F3/FILIβHMRPHMRCAIL-1F3/FILIβHMRPHMRCAIL-1F3/FILIβHMRPHMRCAIL-1F3/FILIβHMRPHMRCAIL-1F3/FILIβHMRPHMRCAIL-1F3/FILIβHMRCAHMRCAIL-16 <th>CCL5/RANTES</th> <th>H M CR</th> <th>H M CR F</th> <th>НМ</th> <th></th>	CCL5/RANTES	H M CR	H M CR F	НМ	
CCL13/MCP-4     H     H     H       CXCL1/GROα     H     H     H       CXCL3/L-8     HCa FP     HCa FP     HCa P     H       CXCL10/IP-10     HMCR     HMCR     HM     H       IFN-α     HMCR     HMRCR     HM     H       IFN-β     HMR     HMR     HM     H       IL-1α/IL-1F1     HMRCRP     HMR     HMR     H       IL-1β/IL-1F2     HMRCACRFP     HMR     HMR     I       IL-1β/IL-1F2     HMRCACRFP     HMR     HMR     I       IL-1F5/FILIδ     HMR     HM     I     I       IL-1F5/FILIδ     H     H     I     I       IL-1F7/FILIξ     H     H     I     I       IL-1F9/IL-1H1     H     H     I     I       IL-1F9/IL-1H1     H     H     I     I       IL-1F9/IL-1H1     H     H     I     I       IL-1F0/IL-1HY2     H     I     I     I     I <tr< th=""><th>CCL7/MCP-3</th><th>НМ</th><th>НМ</th><th>Н</th><th></th></tr<>	CCL7/MCP-3	НМ	НМ	Н	
CXCL1/GROα     H     H     H       CXCL8/IL-8     H Ca FP     H Ca FP     H Ca P     H       CXCL10/IP-10     H M CR     H M CR     H M     H       IFN-α     H M CR     H M R CR P     H M     H       IFN-β     H M R CR P     H M R CR P     H M R     H M       IL-1α/IL-1F1     H M R CA CR FP     H M R CR P     H M R     H       IL-1α/IL-1F2     H M R Ca CR FP     H M R Ca CR FF     H M R FP     -       IL-1F5/FILIδ     H     H M     -     -     -       IL-1F5/FILIδ     H M     H M     -<	CCL8/MCP-2	НМ	Н	Н	
CXCLB/IL-8     H Ca F P     H Ca F P     H Ca P     H       CXCL10/IP-10     H M CR     H M CR     H M     H       IFN-α     H M CR     H M R CR P     H M R CR P     H M       IFN-β     H M R     H M R     H M     H       IL-1α/IL-1F1     H M R CR P     H M R CR P     H M R     H M       IL-1α/IL-1F1     H M R Ca CR FP     H M R Ca CR EF     H M R FP     ·       IL-1F5/FILIδ     H     H M     H M     ·     ·       IL-1F5/FILIδ     H     H     ·     ·     ·       IL-1F5/FILIδ     H     H     ·     ·     ·       IL-1F5/FILIδ     H     H     ·     ·     ·       IL-1F3/IL-1F3     H M     H     ·     ·     ·       IL-1F8/FILIφ     H     ·     ·     ·     ·       IL-1F3/IL-1H1     H     H     ·     ·     ·       IL-1F3/IL-1H1     H     H     ·     ·     ·     ·  <	CCL13/MCP-4	Н	Н	Н	
CXCL10/IP-10     HM CR     HM CR     HM CR     HM       IFN-α     HM CR     HM RCR PPr     HM	CXCL1/GRO $\alpha$	Н	Н	Н	
IFN-α     HM CR P     HMR CR FPPr     HM       IFN-β     HM R     HM R     HM R       IL-1α/IL-1F1     HM RCR P     HM R CR P     HM R       IL-1α/IL-1F2     HM RCa CR FP     HM RCA CR FP     HM RF P       IL-1β/IL-1F2     HM R Ca CR FP     HM R Ca CR FF     HM RF P       IL-1F5/FILIδ     H     HM	CXCL8/IL-8	H Ca F P	H Ca F P	H Ca P	Н
IFN-β     HMR     HMR     HM       IL-1α/IL-1F1     HMRCRP     HMRCRP     HMR       IL-1β/IL-1F2     HMRCaCRFP     HMRCaCREF     HMRFP       IL-15/FILIδ     H     HM	CXCL10/IP-10	H M CR	H M CR	НМ	
IL-1α/IL-1F1     HMRCRP     HMRCRP     HMR       IL-1β/IL-1F2     HMRCaCRFP     HMRCaCREF     HMRFP       IL-1F5/FILIδ     H     HM	IFN-α	H M CR P	H M R CR F P Pr	НМ	
IL-1β/IL-1F2     HMRCaCRFP     HMRCaCREF     HMRFP       IL-1F5/FILIδ     H     HM       IL-1F5/FILIδ     H     HM       IL-1F6/FIL1ε     HM     HM       IL-1F7/FILIζ     H     H       IL-1F8/FILIη     HM     H       IL-1F8/FILIη     HM     H       IL-1F9/IL-1H1     H     H       IL-1F0/IL-1HY2     H     H       IL-1F10/IL-1HY2     H     H       IL-1F10/IL-1HY2     H     H       IL-1F3     HMRCaCRE     HMRCaCRE       IL-16     HMRCaCRE     HMRCaCRE     HMRCaFP       IL-16     HMRCaCRE     HMRCaCRE     HMRCaFP       IL-10     HMRCaCRE     HMRCaCREF     HMRCaFP       IL-12     HMRCaFP     HMRCaCRE     HMRCAEFP       TNF-α     HMRBCACRE     HMRBCACRE     HMRCAEFP	IFN-β	HMR	HMR	НМ	
PPr       IL-1F5/FILIδ     H     HM       IL-1F5/FILIδ     HM     HM       IL-1F6/FIL1ε     HM     HM       IL-1F7/FILIζ     HM     HM       IL-1F8/FILIη     HM     HM       IL-1F8/FILIη     HM     HM       IL-1F9/IL-1H1     H     H       IL-1F9/IL-1H12     H     H       IL-1F0/IL-1HY2     H     H       IL-1F3/IL-1F3     HMEP     HMREP     HM       IL-16     HMRCaCRE     HMRCaCRE     HMRCaFP     HMR       IL-16     HMRCaCREF     HMRCaCREF     HMRCaFP     HMR       IL-10     HMRCaCREF     HMRCaCREF     HMRCaFP     HMR       IL-12     HMRCaFP     HMRCaCRE     HMRCaFP     HMR       TNF-α     HMRBCaCRE     HMRBCACRE     HMRCaEFP     HMRCaEFP	IL-1α/IL-1F1	H M R CR P	H M R CR P	H M R	
IL-1F6/FIL1ε   HM   HM     IL-1F7/FILIÇ   H   H     IL-1F8/FILIη   HM   HM     IL-1F9/IL-1H1   H   H     IL-1F9/IL-1H1   H   H     IL-1F3/IL-1H12   H   H     IL-1F3/IL-1F3   HMEP   HMREP   HM     IL-1ra/IL-1F3   HMEP   HMRCaCRE   HMRCaFP   HMR     IL-16   HMRCaCRE   HMRCaCRE   HMRCaFP   HMR     IL-10   HMRCaCREF   HMRCaFPF   HMR   HMR     IL-12   HMRCaFP   HMRCaCRE   HMRCaFPF   HMR     TNF-α   HMRBCaCRE   HMRBCACRE   HMRCAEFP   HMRCAEFP	IL-1β/IL-1F2	H M R Ca CR F P		HMRFP	
IL-1F7/FILIC     H     H       IL-1F8/FILIΩ     HM     HM       IL-1F9/IL-1H1     H     H       IL-1F9/IL-1H12     H     H       IL-1F10/IL-1HY2     H     H       IL-1ra/IL-1F3     HMEP     HMREP     HM       IL-16     HMRCaCRE     HMRCaCRE     HMRCaFP     HMR       IL-10     HMRCaCREF     HMRCaCREF     HMRCaFP     HMR       IL-12     HMRCaFP     HMRCaFPr     HMP     HMR       TNF-α     HMRBCaCRE     HMRBCACRE     HMRCAEFP     HMRCAEFP	IL-1F5/FILΙδ	Н	НМ		
IL-1F8/FILiη     HM     HM       IL-1F9/IL-1H1     H     H       IL-1F9/IL-1H12     H     H       IL-1F10/IL-1HY2     H     H       IL-1Fa/IL-1F3     HMEP     HMREP     HM       IL-16     HMRCa CRE FP     HMRCa CRE FP     HMRCa CRE FP     HMRCa CRE FP     HMRCa CRE FP     HMRCa FP       IL-10     HMRCa CRE PV     HMRCa FPP     HMRCa FP     HMR       IL-12     HMRCa FP     HMRCa CRE HMRBCa CRE     HMRCa EFP     HMRCa EFP	<b>IL-1F6/FIL1</b> ε	НМ	НM		
IL-1F9/IL-1H1     H     H       IL-1F9/IL-1H12     H     IL-1F3       IL-1ra/IL-1F3     HMEP     HMREP     HM       IL-6     HMRCaCRE FP     HMRCaCRE FP     HMRCaFP     HMR       IL-10     HMRCaCRE PV     HMRCaCREF FP     HMRCaFP     HMR       IL-12     HMRCaFP     HMRCaCRE HMRBCaCRE     HMRCaFP     HMR       TNF-α     HMRBCACRE     HMRBCACRE     HMRCAEFP     HMRCAEFP	IL-1F7/FILIζ	Н	Н		
IL-1F10/IL-1HY2     H       IL-1ra/IL-1F3     HMEP     HMREP     HM       IL-6     HMRCaCRE FP     HMRCaCRE FP     HMRCaCRE FP     HMRCaFP     HMR       IL-10     HMRCaCREF PV     HMRCaCREF FP     HMRCaFP     HMRCaFP     HMR       IL-12     HMRCaFP     HMRCaFPF     HMP     HMR       TNF-α     HMRBCaCRE     HMRBCACRE     HMRCaEFP	IL-1F8/FILIη	НМ	НМ		
IL-1ra/IL-1F3 HMEP HMREP HM   IL-6 HMRCaCRE FP HMRCaCRE FP HMRCaFP HMR   IL-10 HMRCaCREF PV HMRCaCREF PV HMRCaFP HMRCaFP   IL-12 HMRCaFP HMRCaFPr HMP HMR   TNF-α HMRBCaCRE HMRBCACRE HMRCaFP HMRCaFP	IL-1F9/IL-1H1	Н	Н		
IL-6HMRCaCRE FPHMRCaCRE FPHMRCaFPHMRIL-10HMRCaCREF PVHMRCaCREF PVHMRCaFPHMRIL-12HMRCaFP HMRCaCREHMRCaFPrHMPHMRTNF- $\alpha$ HMRBCaCREHMRBCaCRE HMRBCaCREHMRCaFPHMRCaFP	IL-1F10/IL-1HY2	Н			
FP     FP       IL-10     HMRCaCREF PV     HMRCaCREF PV     HMRCaFP     HMRCaFP       IL-12     HMRCaFP     HMRCaFPPr     HMP     HMR       TNF-α     HMRBCaCRE     HMRBCaCRE     HMRCaFP     HMRCaFP	IL-1ra/IL-1F3	HMEP	HMREP	НМ	
PV     PV       IL-12     HMRCaFP     HMRCaFPPr     HMP     HMR       TNF-α     HMRBCaCRE     HMRBCaCRE     HMRCaFP     HMRCaFP	IL-6			H M R Ca F P	HMR
TNF-α HMRBCaCRE HMRBCaCRE HMRCaEFP	IL-10			H M R Ca F P	HMR
	IL-12	H M R Ca F P	H M R Ca F P Pr	НМР	HMR
	<b>ΤΝF-</b> α				

TLR-ASSOCIATED MOLECULES				
Molecule	Antibodies	Proteins	ELISAs/Assays	Primer Pairs
Profilin-like Protein	Tg			
RP105	М			Н

Abbreviation Key: B: Bovine Ca: Canine CR: Cotton Rat E: Equine F: Feline H: Human M: Mouse P: Porcine Pr: Primate R: Rat Tg: T. gondii V: Viral



For more information on TLRs and Associated Molecules, please visit our website at www.RnDSystems.com/go/TLR

